Quick & Dirty Time Series Analysis with Clojure & Incanter

Hi!

I'm Bruce Durling

@otfrom

CTO of green big data startup Mastodon C

www.mastodonc.com

Co-Organizer & Co-Founder
of the *London Clojurians*

Step 0

Log Files
Databases
APIs

People

Step 1

ETL

(this will take longer than you think)

How big is your data?

No, I mean
OMFG BIG

Use Hadoop

clojure-hadoop, cascalog, Hive

GBs or lower?

JFDI

incanter.io
read-dataset

Grouping
Counting
Formatting

incanter.core

dataset
col-names
conj-cols

$ or sel
$group-by
$where

$map
$rollup
$join

clj-time.core
clj-time.format
clj-time.coerce

DATA

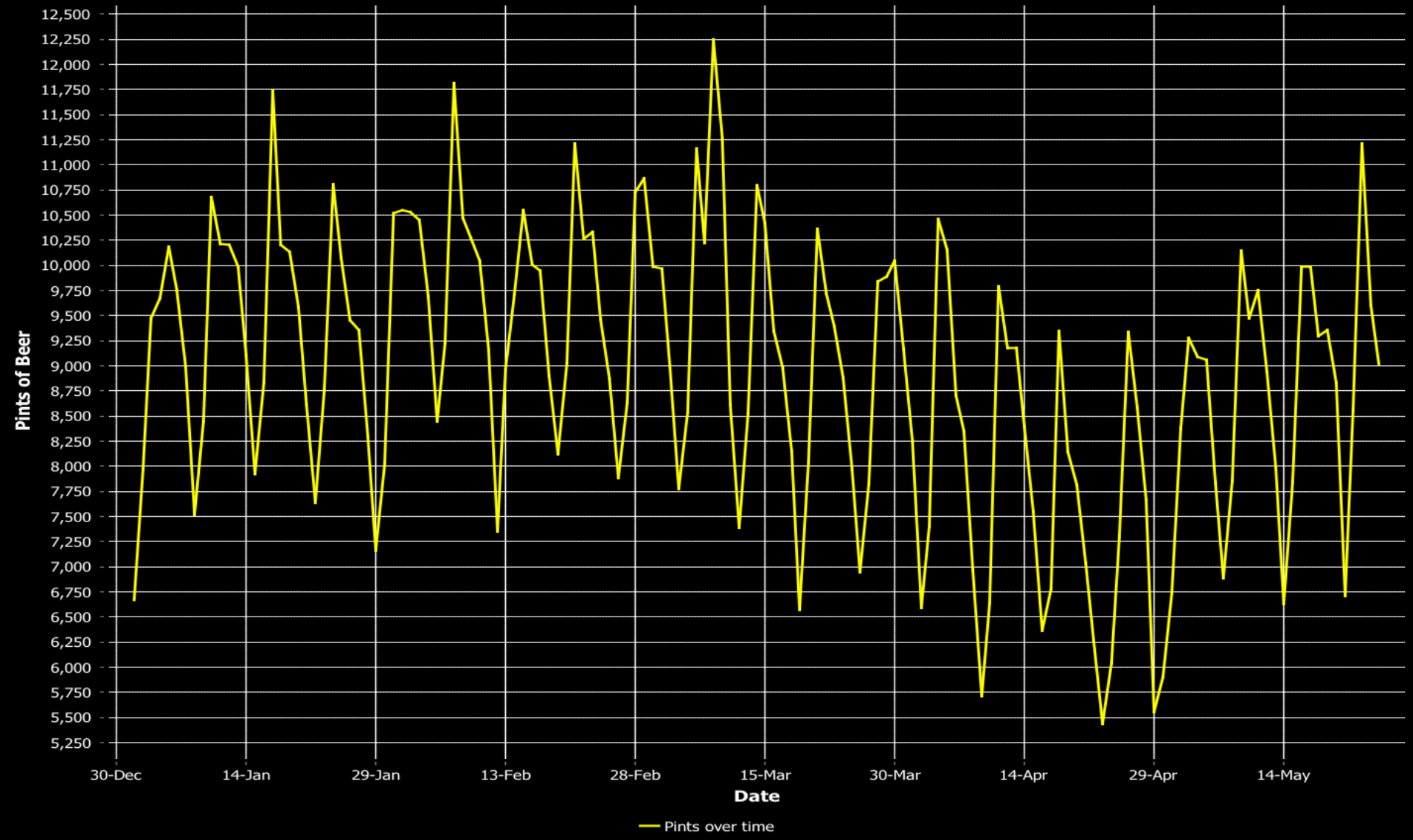
data

Step 2

Graph It

incanter.charts
time-series-plot

Look for
Extreme Outliers
Noise
Trend
Seasonality


12,500
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7,750
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6,250
6,000
5,750
5,500
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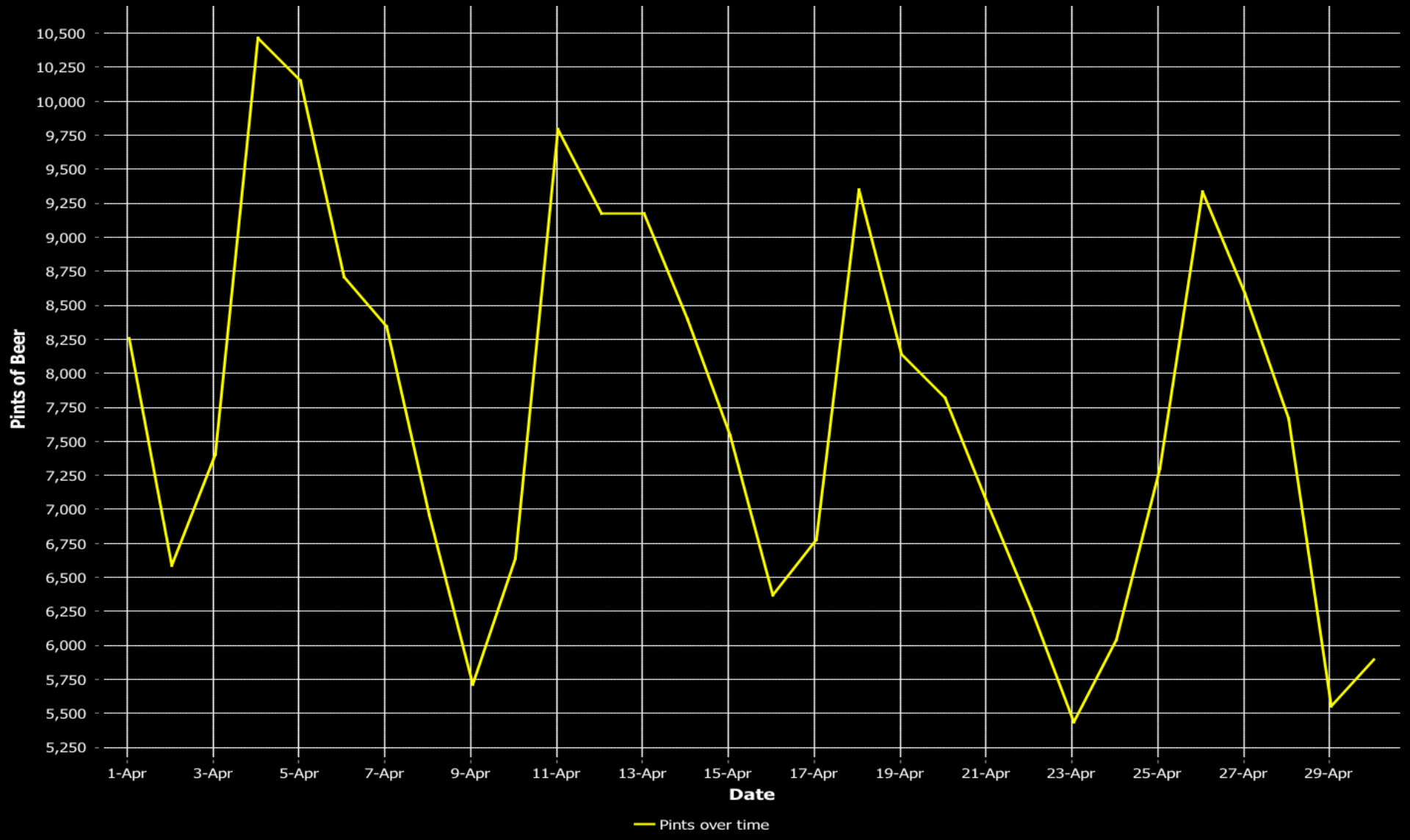
Pints of Beer
30-Dec
14-Jan
29-Jan
13-Feb
28-Feb
15-Mar
30-Mar
14-Apr
29-Apr
14-May
Date
Pints over time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5-Apr
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9-Apr
11-Apr
13-Apr
15-Apr
17-Apr
19-Apr
21-Apr
23-Apr
25-Apr
27-Apr
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Pints over time

Step 3

Deal with outliers
mean
median
kill

incanter.stats
mean
median

Deal with noise

High Frequency Data can be misleading

incanter.zoo
roll-mean
roll-median
roll-apply

Detrend the data

Difference

```
(defn difference [lag coll]
    (incanter.core/minus
        (drop lag coll) (drop-last lag coll)))
```

Deseasonalise the data

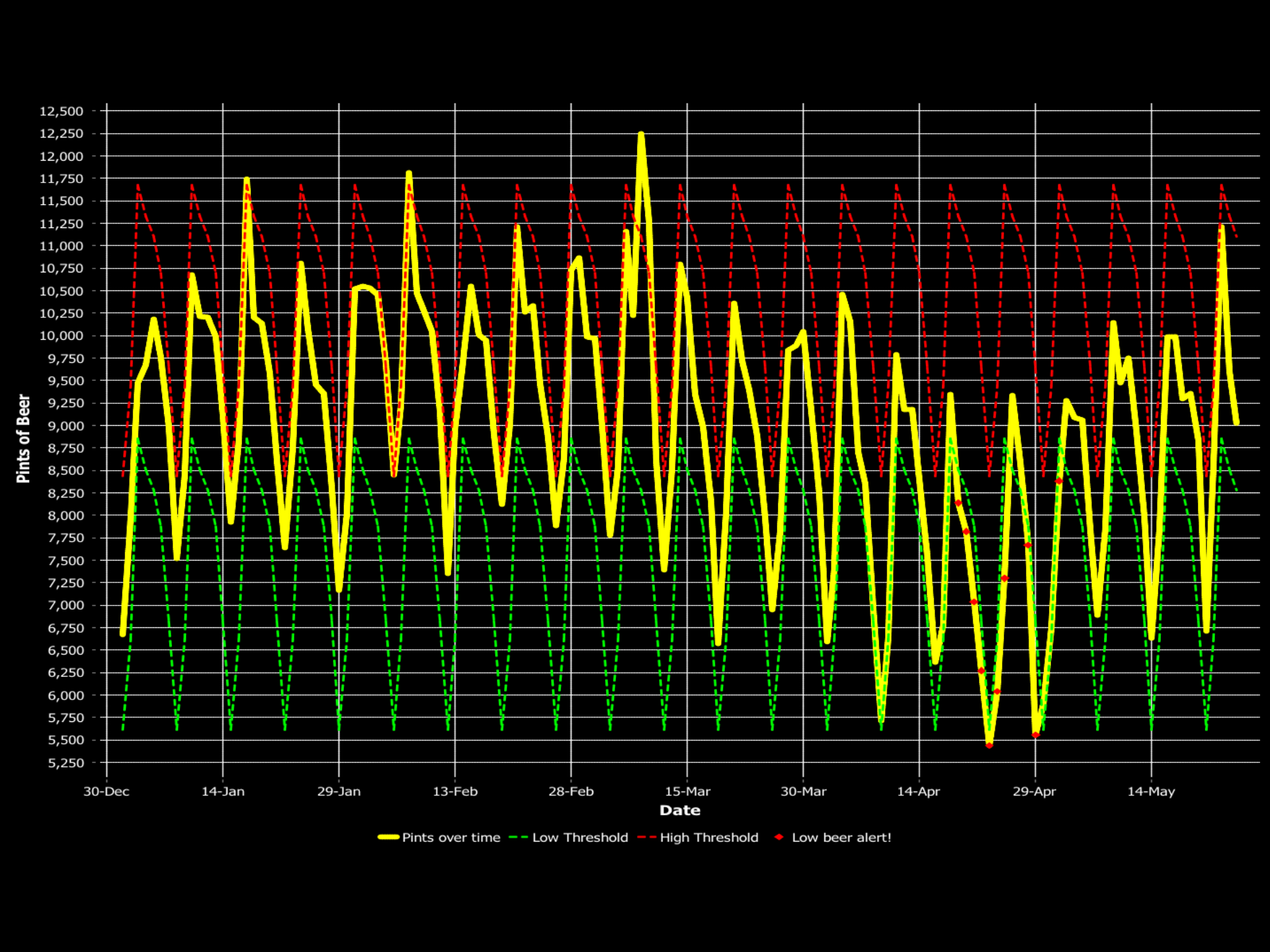
incanter.core
$rollup

Step 4

Find The Outliers

Standard Deviation

incanter.stats
sd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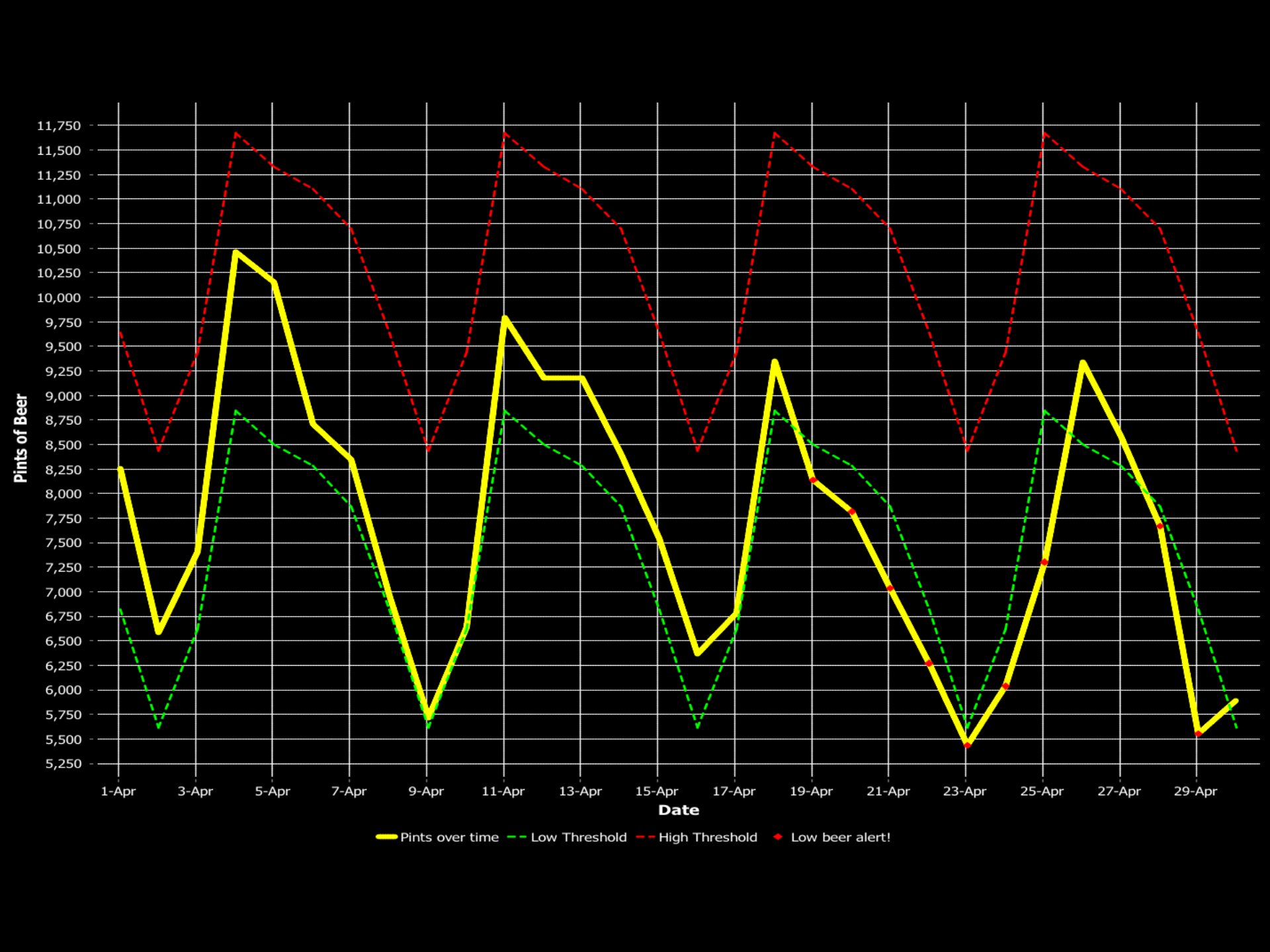
Pints over time
Low Threshold
High Threshold
Low beer alert!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Pints over time
Low Threshold
High Threshold
Low beer alert!

Step 5

Real Time Alerts

```
(rand-nth
 [:riemann
  :nimrod
  :storm])
```

Step 6

Iterate

Formulate a Hypothesis

Get the data you need

(step-0 previous-results new-data)

Thank You

Mastodon C

"Herds of intelligent roaming Hadoop jobs, migrating from datacentre to datacentre, in search of cold iron."
@mrchrisadams

@MastodonC

www.mastodonc.com